Nicholas Saunders

NSF Graduate Research Fellow

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EDUCATION

University of Hawai'i at Mānoa

PhD Astronomy — advisors: Daniel Huber, Jennifer van Saders — expected 2025

MSc Astronomy — June 2021

University of Washington

BS Physics & Astronomy (with Honors) — advisors: Rodrigo Luger, Rory Barnes — June 2018

BA Comparative Literature (emphasis: Cinema Studies) — June 2018

APPOINTMENTS

Visiting Scientist — Aug 2021 – present
Department of Astrophysics, American Museum of Natural History, New York, NY

NSF Graduate Research Fellow — Sept 2019 – present
Institute for Astronomy, University of Hawai'i at Mānoa, Honolulu, HI

Undergraduate Research Assistant — Jan 2016 – Aug 2018
University of Washington, Seattle, WA

Planetary Science Intern — Apr 2011 – June 2013
The Bear Fight Institute, Winthrop, WA

RELEVANT EMPLOYMENT

Kepler & K2 Training Materials Developer — Apr 2020 – Sept 2020
NumFocus, STScI, The Astropy Project, Remote from Honolulu, HI

Research Support Scientist, Kepler/K2 Guest Observer Office — Aug 2018 – Aug 2019
NASA Ames Research Center, Mountain View, CA

Data Visualization Analyst, UW Mobile Planetarium — June 2018 – Aug 2018
University of Washington, Seattle, WA

GRANTS, AWARDS, & TELESCOPE TIME

"The Fate of Planets Transiting Evolved Stars," Keck/KPF (UH)	**PI, 3n**	2023 – present
"The Fate of Planets Transiting Evolved Stars," Keck/HIRES (UH)	**PI, 9n**	2022 – present
"Planetary Archaeology…" Keck/HIRES (NASA)	**Co-I, 5n, $55,662**	2021 – present
Travel Award, Aspen Center for Physics Winter Workshop	**$1,903.30**	2023
"Planetary Archaeology…" TESS Space Telescope (TESS GI)	**Co-I, $70,000**	2021
National Science Foundation Graduate Research Fellowship		2021
Honorable Mention, National Science Foundation Graduate Research Fellowship		2019
Departmental Honors in Astronomy, University of Washington		2018
1st Place: Best Online Photo Essay, Washington Newspaper Publishers Association		2016
Washington NASA Space Grant, University of Washington		2013
Irving and Louise Donnergaard Endowment, University of Washington		2013

PUBLICATIONS

NASA ADS | **22** total publications (3 first author, 7 second author) | **1,900+** total citations | h-index = **11**

First Author

3. **Saunders, N.**, van Saders, J., Lyttle, A. et al. (2023, submitted) Stellar Cruise Control: Weakened Magnetic Braking Leads to Sustained Rapid Rotation of Old Stars. arXiv:2309.05666
2. **Saunders, N.**, Grunblatt, S., Huber, D., et al. (2022) TESS Giants Transiting Giants I. A Non-inflated Hot Jupiter Orbiting a Massive Subgiant. AJ, 163, 2

1. **Saunders, N.**, Luger, R., Barnes, R. (2019) The Pointing Limits of Transiting Exoplanet Light Curve Characterization with Pixel Level De-correlation. AJ, 157, 197

Co-author

19. Pereira, F., Grunblatt, S., Psaridi, A. et al. including **Saunders, N.** (2023, submitted) TESS Giants Transiting Giants V. Two hot Jupiters orbiting red-giant hosts. arXiv: 2311.06678
18. Hey, D., Huber, D., Shappee, J. et al. including **Saunders, N.** (2023, submitted) The Far Side of the Galactic Bar/Bulge Revealed Through Semi-Regular Variables. aXiv:2305.19319
17. Grunblatt, S., **Saunders, N.**, Huber D. et al. (2023, submitted) An Unlikely Survivor: A Low-density Hot Neptune Orbiting a Red Giant Star. arXiv:2303.06728
16. Grunblatt, S., **Saunders, N.**, Chontos, A. et al. (2023) TESS Giants Transiting Giants III. An Eccentric Warm Jupiter Supports a Period-Eccentricity Relation for Giant Planets Transiting Evolved Stars. AJ, 165, 2
15. Vissapragada, S., Chontos, A., Greklek-McKeon, M. et al. including **Saunders, N.** (2022) The Possible Tidal Demise of Kepler's First Planetary System. ApJL, 941, 2
14. The Astropy Collaboration, Price-Whelan, A. M., Lian Lim, P. et al. including **Saunders, N.** (2022) The Astropy Project: Sustaining and Growing a Community-oriented Open-source Project and the Latest Major Release (v5.0) of the Core Package. ApJ, 935, 2
13. Grunblatt, S., **Saunders, N.**, Sun, M. et al. (2022) TESS Giants Transiting Giants II. The Hottest Jupiters Orbiting Evolved Stars. AJ, 163, 3
12. Stello, D., **Saunders, N.**, Grunblatt, S., et al. (2022) TESS asteroseismology of the Kepler red giants. MNRAAS, 512, 2
11. Hedges, C., **Saunders, N.**, Martínez-Palomera, J. (2021) Contaminante: A Tool for Automatically Finding a Close-to-optimal Aperture for Transiting Signals in Kepler, K2, and TESS Data. RNAAS, 5, 260
10. Grunblatt, S., Zinn, J., Price-Whelan, A., Angus, R., **Saunders, N.** et al. (2021) Age-Dating Red Giant Stars Associated with Galactic Disk and Halo Substructures. ApJ, 916, 88
9. Hedges, C., Angus, R., Barentsen, G., **Saunders, N.**, Montet, B.T., Gully-Santiago, M. (2020) Systematics-insensitive Periodogram for Finding Periods in TESS Observations of Long-period Rotators. RNAAS, 4, 220
8. Hedges, C., **Saunders, N.**, Barentsen, G., Coughlin, J., Vinícius de Miranda Cardoso, J., Kostov, V., Dotson, J., Cody, A.M. (2019) Four Small Planets Buried in *K2* Systems: What Can We Learn for TESS? ApJL, 880, 1
7. Feinstein, A.D., Montet, B.T., Bean, J.L. et al. including **Saunders, N.** (2019) eleanor: A tool for extracting light curves from the TESS Full-Frame Images. PASP, 131, 1003
6. David, T., Cody, A.M., Hedges C. et al. including **Saunders, N.** (2019) A warm Jupiter-sized planet transiting the pre-main sequence star V1298 Tau. AJ, 158, 2
5. Mahabal, A., Rebbapragada, U., Walters, R. et al. including **Saunders, N.** (2019) Machine Learning for the Zwicky Transient Facility. PASP, 131, 997
4. Hedges, C., **Saunders, N.**, Barensen, G. et al. (2019) A Hot Jupiter Exoplanet Candidate towards the Galactic Center Identified in Kepler/K2 Campaign 9 Microlensing Survey. RNAAS, 3, 1
3. Barentsen, G., Hedges, C., **Saunders, N.** et al. (2018) Kepler's Discoveries Will Continue: 21 Important Scientific Opportunities with Kepler & K2 Archive Data. arXiv:1810.12554
2. Cody, A.M., Barentsen, G., Hedges, G., Gully-Santiago, M., Dotson, J., Barclay, T., Bryson, S., **Saunders, N.** (2018) A catalog of 29 open clusters and associations observed by the Kepler and K2 Missions. RNAAS, 2, 4
1. Luger, R., Kruse, E., Foreman-Mackey, D., Agol, E., **Saunders, N.** (2018) An Update to the EVEREST K2 Pipeline: Short Cadence, Saturated Stars, and Kepler-like Photometry down to Kp = 15. AJ, 156, 99

ADVISING

Undergraduate

Advisor, Alicia Chun, Research Experience for Undergraduates, University of Chicago — May 2023 – July 2023
Co-advisor, Erica Sawczynec, Undergraduate Honors Thesis, UH Mānoa — June 2019 – June 2021

High School Students & Teachers

Advisor, Anica Ancheta, Dominic Rice, Holden Suzuki, HI STAR Research, HI High Schools — May 2023 – June 2023
Co-advisor, Alison English, Research Experience for Teachers, Honoka'a High School — June 2022
Advisor, Wilson Chau, Pono Fortune, Gabe Mckillip, HI STAR Research, HI High Schools — July 2020

TEACHING & OUTREACH

"Dying stars swallowing nearby planets," Interview, Hawai'i Public Radio	Jan 2022
Science Pen Pal, Letters to a Pre-Scientist	Sept 2020 – June 2021
Graduate Teaching Assistant, University of Hawai'i	Aug 2019 – Jan 2020
Planetarium Organizer, University of Washington	Jan 2018 – Aug 2018
Teaching Assistant, University of Washington	Jan 2017 – June 2018
Astrobiology Mobile Planetarium Presenter, University of Washington	Mar 2018
Volunteer, NASA Total Solar Eclipse Outreach Event	Aug 2017
Planetarium Presenter, University of Washington	Nov 2015 – Aug 2018

OPEN-SOURCE SOFTWARE

Lead developer →	**giants**: TESS full-frame image photometry & planet search pipeline
Core developer →	**lightkurve**: time-series analysis tools for Kepler/K2 & TESS
Core developer →	**eleanor**: TESS full-frame image photometry pipeline
Contributor →	**everest**: K2 noise removal pipeline

SERVICE

LOC Member, TESS/Kepler Asteroseismic Science Consortium	2023
Graduate Student Representative, University of Hawai'i at Mānoa	Aug 2022 – Aug 2023
Graduate Outreach Representative, University of Hawai'i at Mānoa	Aug 2022 – Aug 2023
Undergraduate Liaison, University of Washington Astronomy Department Faculty Board	Sept 2017 – Aug 2018

TALKS

Invited Talks

"Orbital Evolution of Giant Planets…" ESPF Seminar, STScI, Johns Hopkins University, Baltimore, MD	Jan 2023
"A Catalog of Uniform Exoplanet Parameters," CIPS Seminar, University of California, Berkeley, CA	Apr 2019
"Sputtering Effects on K2…" Kepler/K2 Guest Observer Office, NASA Ames, Moffett Field, CA	Oct 2017

Contributed Talks

"Evidence for Efficient Tidal Realignment of Hot Jupiters…" TASC7 / KASC14, Honolulu HI	July 2023
"Orbital Evolution of Giant Planets After the Main Sequence," AAS 241, Seattle, WA	Jan 2023
"TESS Giants Transiting Giants IV: The Hottest Evolved Neptune," AAS 241, Seattle, WA	Jan 2023
"Tracing Hot Jupiter Evolution," Dissertation Proposal, University of Hawai'i	Dec 2021
"Refining Weakened Magnetic Braking with Hierarchical Modeling," University of Hawai'i	June 2021
"TOI-2184b: A Non-inflated Hot Jupiter…" TESS Science Team Meeting #25, Virtual	Mar 2021
"Revealing the Mysteries of Exoplanets Around Evolved Stars with TESS," University of Hawai'i	Sept 2020
"Revealing the Mysteries of Exoplanets Around Evolved Stars with TESS," AAS 235, Honolulu, HI	Jan 2020
"Analysis of Simulated Kepler/K2 Exoplanet Transit Parameters" AAS 233, Seattle, WA	Jan 2019
"Simulated CCD Photometry," Kepler/K2 Science Office, NASA Ames, Moffett Field, CA	May 2018
"Searching for Exoplanets…" UW Undergraduate Research Symposium, Seattle, WA	May 2018
"De-trending K2 Exoplanet Targets for High Spacecraft Motion," AAS 231, Washington DC	Jan 2018
"K2 Pixel Sensitivity Variations," UW Undergraduate Research Symposium, Seattle, WA	May 2017

Outreach Talks

"Exploring Strange New Worlds," HI STAR, UH Maui College, Kahului, HI	June 2023
"Putting the Science in Science Fiction," Astronomy on Tap, San Jose, CA	May 2019
"Putting the Science in Science Fiction," Astronomy on Tap, Seattle, WA	Apr 2018
"The Search for Habitable Worlds," Astrobiology Mini Talks, Museum of Flight, Seattle, WA	Apr 2018

POSTERS

"Stellar Cruise Control: Weakened Magnetic Braking…" TASC7 / KASC14, Honolulu, HI	July 2023
"Spin-Orbit (Re?) Alignment of Giant Planets," Late-Stage and Post-MS Systems Workshop, Aspen, CO	Mar 2023
"Giants Transiting Giants," Late-Stage and Post-MS Systems Workshop, Aspen, CO	Mar 2023
"Evidence for Weakened Magnetic Braking in Old Stars," TASC6 / KASC13, Leuven, Belgium	July 2022
"Evidence for Weakened Magnetic Braking in Old Stars," Cool Stars 21, Toulouse, France	July 2022

"No Planet Left Behind…" Exoplanets IV, Las Vegas, NV	May 2022
"Quantifying Biases with Simulated Kepler/K2 Light Curves," Kepler SciCon V, Glendale, CA	Mar 2019
"Exoplanet Science with the Lightkurve Python Package," AAS 233, Seattle, WA	Jan 2019